

## PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Attorney Docket No.: 2950.27US01

Buckley et al.

Confirmation No.: 5623

Application No.: 09/435,748

Examiner: M. Ruthkosky

Filed: November 8, 1999

Group Art Unit: 1745

Re: BATTERIES WITH THIN ELECTRODES

SUPPLEMENTAL RESPONSE AFTER FINAL

Box AF  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Office Action of March 26, 2002 and in further response to the Amendment filed on May 10, 2002, please consider the additional remarks below.

REMARKS

Claims 29-44 and 52-54 are pending.

Applicants thank the Examiner for the courtesy extended to their undersigned representative in a phone interview on June 19, 2002. The Yamata reference and the Oak Ridge Bulletin reference were discussed. The Examiner acknowledged differences with the art, but indicated that changing dimensions can be considered within general scientific knowledge. The Examiner indicated that it would be more persuasive to outline how processing aspects of the cited references may provide a practical barrier relating to the features being claimed by Applicants. With respect to the section 112, second paragraph issues, the Examiner indicated that these rejections can be readdressed after the obviousness issues were resolved.

Application No. 09/435,748

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 29-44 and 52-54 under 35 U.S.C. § 103(a) as being unpatentable over the Oak Ridge National Laboratory Bulletin, 9/1/1998 (the Oak Ridge Bulletin) in view of U.S. Patent 5,482,797 to Yamata et al. (the Yamata patent). Applicants do not repeat arguments from the Amendment of May 10, 2002. Below, Applicants focus on issues discussed in the Phone Interview described above. Specifically, while the Examiner has asserted that the alteration of the dimensions of the electrode is within the general scientific knowledge, Applicants respectfully disagree. Applicants do not believe that the Examiner has presented a case for prima facie obviousness. Applicants clarify these issues below.

The battery electrodes described in the Yamada patent include particles having a secondary or aggregated particle size of 0.1 to 80 microns. See column 4, lines 12-14. As exemplified, the carbon materials are mixed with 5 weight percent binder and pressed against a nickel plate. Conventional processing approaches are not suitable for forming electrodes as presently claimed. As described, for example, in U.S. Patent 6,316,144, a dried cathode material was compressed between flat plates at a relatively high pressure of 25 bars (363 pounds per square inch) to yield an electrode thickness of 100 microns. See column 18, lines 48-54. The Yamada patent uses much lower pressures to form the electrode. Another similar approach for forming electrodes is described in U.S. Patent 5,919,589. Using graphite particles with a particle size of 2 microns, electrodes were formed with thicknesses of 90 microns. These patents like the Yamada patent do not describe how to alter the electrode processing approaches to form a thinner electrode. Similarly, these patents, like the Yamata patent, do not relate particle size to electrode thickness in any way. The Examiner has not pointed to any suggestion in the references of record that electrode thickness is in any way limited by particle size.

Applicants' specification describes approaches for the formation of thin electrodes, for example, from page 52, line 33 to page 55, line 11. A first step generally involves

Application No. 09/435,748

dispersing the electroactive powders. As noted in Applicants' specification, small particles tend to agglomerate with relatively weak electrostatic forces. The agglomerates can be dispersed with a liquid to break the weakly held agglomerates. As described in Applicants' specification, the dispersions can be applied as a coating using, for example, spray coating, spin coating, ink jet printing, offset printing or electrophoretic deposition. See, page 53, line 31 to page 54, line 16.

In summary, the cited references do not describe approaches for producing thin battery structures with particulate electroactive material. The cited references based on particulate electroactive materials use conventional processing approaches designed to form conventional battery structures generally with electrodes roughly an order of magnitude thicker or more than the claimed electrode thicknesses. Thus, Applicants assert that the teachings of the cited references do not lead a person of ordinary skill in the art to the presently claimed invention. The Oak Ridge Bulletin is very specific for sputtering approaches and thin films. The Oak Ridge Bulletin does not teach or suggest particulates as the electroactive material or the use of binders that would be needed to hold particles together in a stable structure.

Since the cited references do not lead a person of ordinary skill in the art to Applicants' claimed invention, the cited references do not render Applicants' invention obvious. Applicants respectfully request withdrawal of the rejection of claims 29-44 and 52-54 under 35 U.S.C. § 103(a) as being unpatentable over the Oak Ridge National Laboratory Bulletin, 9/1/1998 in view of the Yamata patent.

#### CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

Application No. 09/435,748

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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*Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 16-0631.*

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being transmitted by facsimile to the U.S. Patent and Trademark Office, Fax No. 703-872-9311 on the date shown below thereby constituting filing of same.

July 26, 2002  
Date

  
Shari R. Thorndike

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## FACSIMILE COVER SHEET

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DATE: July 26, 2002

TO: Examiner Mark Ruthkosky  
Group Art Unit: 1745

FAX #: 703-872-9311

PHONE #: 703-305-0587

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Applicant: BUCKLEY et al.  
Due Date: July 26, 2002

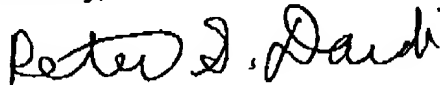
OUR REF.: 2950.27US01

FROM: Peter S. Dardi, Ph.D.  
PHONE #: (612) 349-5746

Attached please find the following document for filing in the above-identified patent application:

- 1) Supplemental Response After Final in response to Final Office Action dated March 26, 2002 and in further response to Amendment filed May 10, 2002; and
- 2) Petition for One Month Extension of Time.

Sincerely,




Peter S. Dardi, Ph.D.  
Reg. No. 39,650

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